

A SHELL MIDDEN AT CASCADE GARDENS,
BROADBEACH, SOUTHEAST QUEENSLAND

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ABSTRACT

A rescue excavation of remnants of a shell midden at Cascade Gardens, Broadbeach, southeastern Queensland showed the site to be relatively recent and poor in anything but molluscan remains.

In mid 1970, the engineers supervising the widening of the Pacific Highway south of Cascade Gardens, Broadbeach, found that their work would destroy the remains of a typical Aboriginal shell midden. The Department of Main Roads immediately asked for the area to be inspected and evaluated by an archaeologist. This was done by M. C. Quinnell, who reported that there was some shell midden extant though much truncated and disturbed by earlier roadworks and local amateurs. Also, there were rumours that burials had been found in that area. The Aboriginal Relics Advisory Committee suggested that such a poorly preserved site did not warrant resumption but that it should not be destroyed without further archaeological investigation. Accordingly, it was decided that the site should be excavated as soon as possible with finance provided by the Department of Aboriginal and Island Affairs. L. Haglund-Calley was asked to direct and M. C. Quinnell acted as assistant. Equipment was provided by the Department of Anthropology and Sociology, University of Queensland, and the Department of Main Roads supplied transport and an office. The work force consisted of museum staff, Main Roads personnel, and volunteers from the Department of Anthropology and Sociology.

The excavation started on 20th July, 1970 and was completed on 26th July. We had then excavated three quarters of the extant midden and were convinced that we would learn no more by continuing. But we supervised the final clearing by machinery and satisfied ourselves that the excavated area was indeed representative.

This report is very much a co-operative effort. Thanks to specialists at the Queensland Museum who analyzed the faunal remains, what seemed a most unpromising site turned out to yield some interesting information.

SITE DESCRIPTION

The midden capped the remains of a sand dune on the eastern bank of the Little Tallebudgera Creek about 700 metres north of the junction between the Pacific Highway and the Nerang Road. (M.R. NP420000 *Burleigh*, Australia 1:50 000 map.)

The 350 and 400 cm contour lines (fig. 1) appeared to be mainly natural, in which case this dune was only a little longer—in a north to south direction—than it was broad, though part of a long stretch of dunes extending further to the north. Much disturbance had taken place, however, and it is likely that this affected the contours of the site to some extent. Judging from the outline of the remaining midden compared to the contours of the surrounding area and taking into account that this is frequently affected by flooding which can cover much of the slopes of the dune, it is unlikely that this patch of midden ever exceeded about 700 square metres. About 65 to 70 square metres remained when the excavation started. Rubbish pits and other disturbances had cut the midden on the western side. A fossicker's trench cut through what would once have been the centre of the midden. The area south of this had been destroyed or disturbed during earlier road making activities which also probably removed some midden on parts of the eastern slope. At the northern end the midden faded away naturally with the slope of the ground. There were also a number of rubbish pits in the remains of the midden, obviously modern and containing pennies, bottles and decaying shoes.

The midden was on the very edge of a mangrove swamp which follows the creek. To the east modern buildings have destroyed any natural vegetation, but the modern beach is only 500 metres away and the intervening area is not likely to have carried a very stable cover, judging from similar, but undeveloped areas nearby. A few large eucalypts were growing on the midden (Plate 27:a) as well as some young *Banksia* trees, but most of the area had been cleared by burning before the arrival of the archaeologists. The area to the north is now a picnic rest area and the natural vegetation has been turned into parkland. Areas within this are still covered by scattered shells, and it seems likely that this would have applied to the crests of most dunes in the area before modern development.

The shell deposits were not uniform in all parts of the site. On the eastern slope, towards the road (Fig. 1), we found three horizons of shell. The topmost (level 1A) was not in situ but material apparently pushed up by machines during road making. Below this, separated from it by a thin layer of pale sand, there were two horizons of shell (levels 1B:1 and 1B:2), both following the slope of the dune but separated by some pale sterile sand. They could be seen all along the slope but merged into one horizon in the highest part of the dune (lines M to P). This is what one could expect. Some shells near the slope of the dune would slide down and be covered by sand as soon as there was a strong east wind (Plate 27:b). The single horizon was between five and ten centimetres thick on the crest of the dune, containing whole or fragmented shells separated by pale to dark grey sand. Further west the horizon thickened, reaching a depth of about thirty

centimetres by lines T to V. Here the shells were very fragmented, closely packed and embedded in black sand with much charcoal (Plate 27:c). Clearly the western slope, though gentle, was favoured as a camping spot. The slope itself was not sufficient to give much protection from sea breezes but it is possible that the crest of the dune carried some sheltering vegetation.

The physical state of the shells varied somewhat but weathering had mainly affected the outer surfaces which were bleached and powdery. Somewhat less weathered and unbroken shells could sometimes, especially in the area L-P/15-20, be seen to underlie more weathered and broken ones, indicating that the difference was due more to the extent of exposure than to a difference in age.

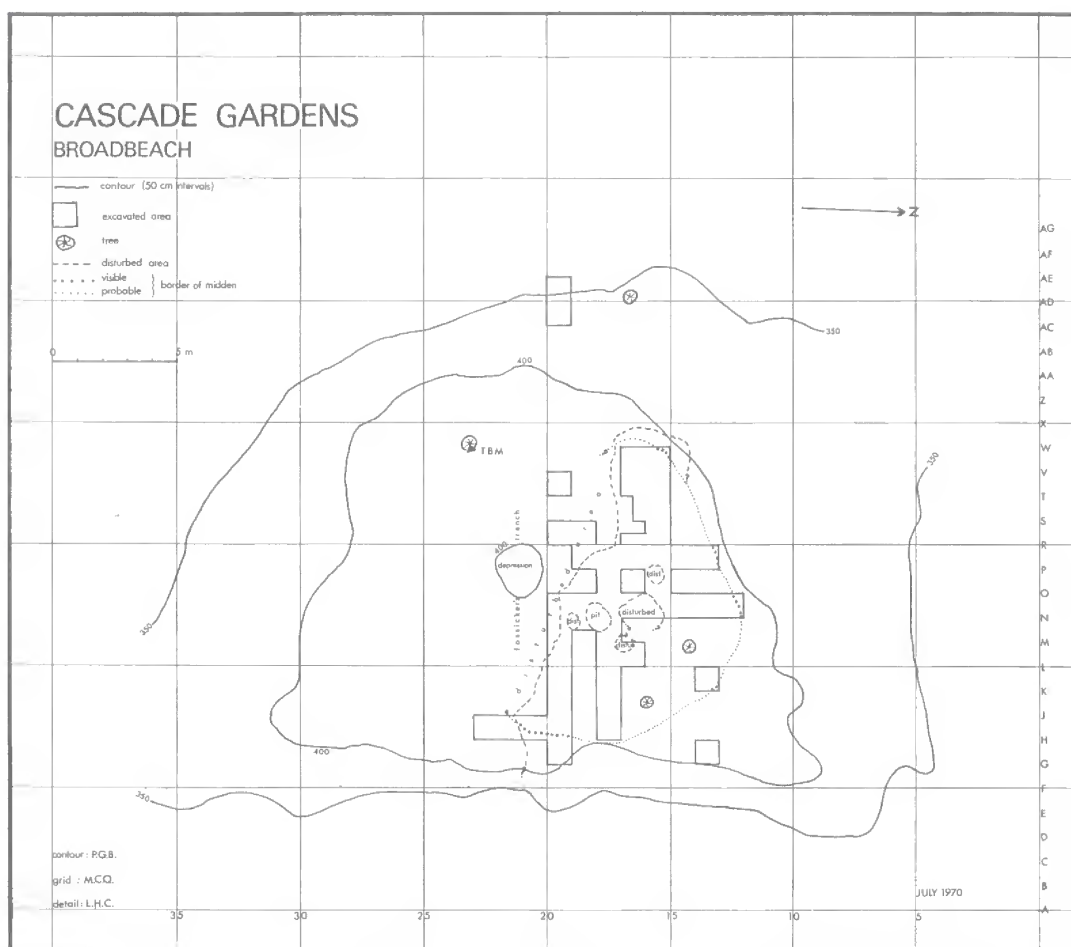


FIG. 1: Contour map of site.

THE FAUNAL CONTENT

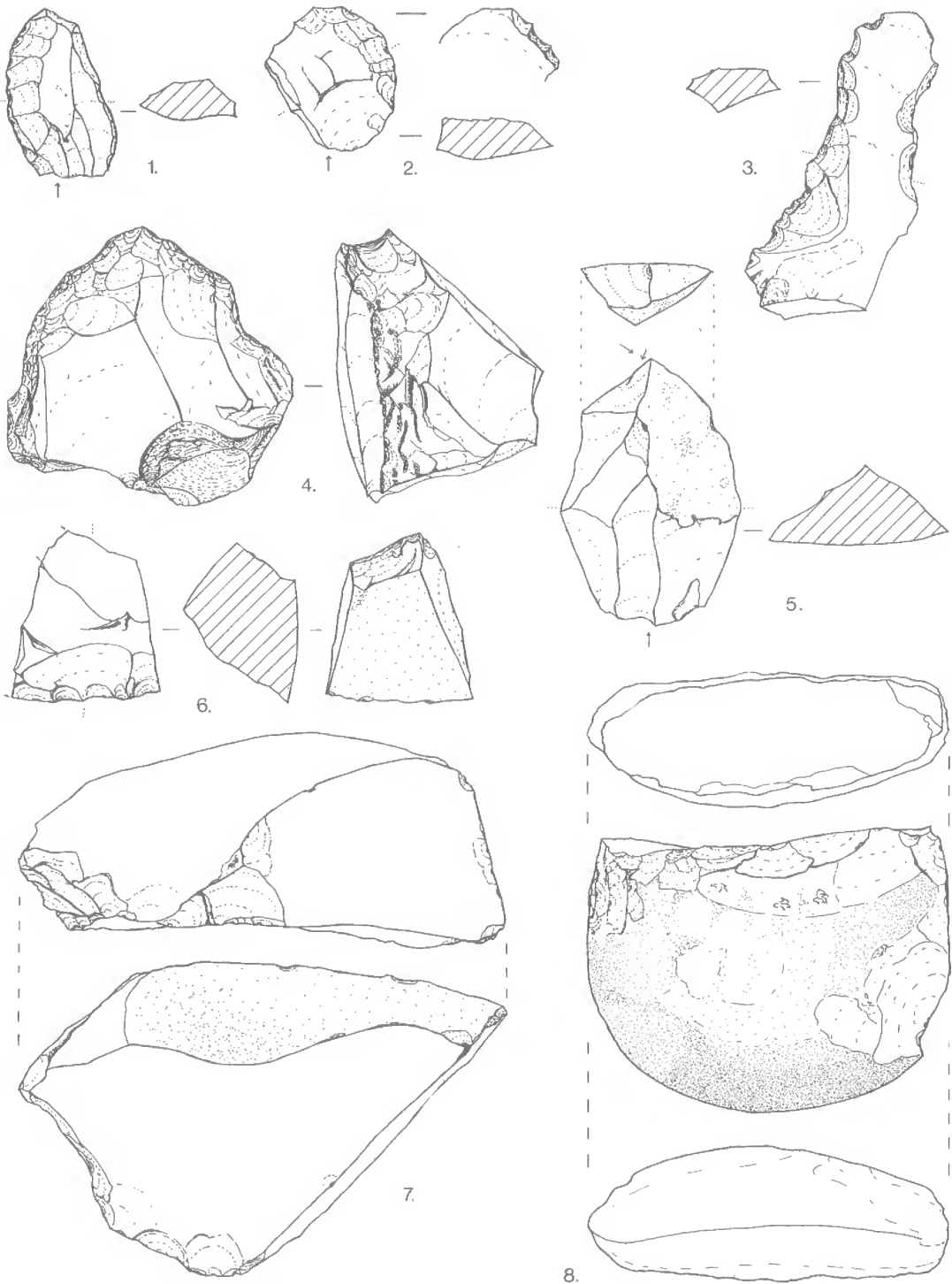
Faunal remains were found throughout the site, occurring in and above the midden deposit. The presence of these remains reflects the Aboriginal occupants exploitation of contiguous terrestrial, estuarine and marine environments for their food resources. The site, situated as it is, in close proximity to the estuarine conditions of Little Tallebudgera creek and the open ocean beach, was admirably suited to such a limited hunter-gatherer economy.

A wide range of land mammal and reptile species were collected (Appendix I) both from the coastal Wallum scrub in the vicinity of the site, e.g. bandicoot (*Isoodon macrourus*) and bearded dragon (*Amphibolurus barbatus*); or ranging further afield, from the wet sclerophyll and closed forest of the Gold Coast hinterland, e.g. pademelon (*Thylogale* sp.). A small number of marine species, turtle (*Chelonia mydas* or *Caretta caretta*) and fish (unidentified) were also present. Mammal and reptile remains however formed only a small proportion of the total faunal content (14.75 kilograms by weight).

Discarded shells form the major portion of faunal remains at Cascade Gardens (Appendix II). The ocean beach intertidal yugari (*Plebidonax deltooides*) was the most dominant species present, comprising 99.7% of the total molluscan remains (by weight). Estuarine and tidal flat species such as *Pyrazus ebeninus* and *Anadara trapezia* were not present in significant numbers. This indicates a deliberate preferential choice on the part of the Aborigines in favour of the yugari as an article of diet. This species is present in a higher proportion than expected in terms of the relative availability of other molluscan populations in nearby habitats.

FIG. 2: Selected artefacts. Implements 1–6 are shown natural size, implements 7–8 are reduced to half natural size.

1. QE 9001-4 Chunky flake with oblique retouch (40–60°) and use-wear on the left margin, steep retouch = backing (71°) on the right. Size: 23 mm × 15 mm × 5 mm.
2. QE 9001-5 Chunky flake with oblique retouch (about 56°) on the right margin and distal end. Steep retouch (close to 90°) on part of left margin, the rest naturally thick. Size: 20 mm × 17 mm × 5 mm.
3. QE 9001-2 Oblong, oblique flake with inverse retouch on both margins. The angle of retouch forming serrations varies between 65–80°. Size: 44 mm × 25 mm × 7 mm.
4. QE 9001-1 Irregular core flaked from several directions and chipped or bruised from use. Size: 42 mm × 40 mm × 30 mm.
5. QE 9001-3 Burin? Chunky flake without retouch apart from two spalls at the distal end. Size: 38 mm × 25 mm × 7 mm.
6. QE 9001-10 Fragment of steep-scraper? Steep retouch (about 68°) from flat pebble face and similar retouch (at about 65–80°) from the opposite face. Size: 21 mm × 26 mm × 17 mm.
7. QE 9001-8 Pebble fragment. Two long rectangular faces meet in edge of about 60° which has been chipped by use. Two triangular faces meet in a flaked edge of about 60–85°, also chipped by use. Size: 133 mm × 69 mm × 93 mm.
8. QE 9001-7 Edge-ground axe. Angle of working edge 70–75°. Note slight twist. Flaked, pecked, ground and polished over most of the surface except deep flake-scars and pitting. Lenticular section. Apparently broken in half but chipped around the broken part thereafter. Size: 79 mm × 104 mm × 40 mm.



No quantification based on the estimated weight of edible flesh has been attempted. On such a basis the contribution of mammals and reptiles would be greater than is apparent from extant bone weight. However this would not alter the fact that at this site shellfish of one species were favoured as a food source.

Thus the land, estuary, and sea shore were all exploited, there being however a strong emphasis on the latter. Gathering as opposed to hunting was the major means of food collection. There is no evidence to indicate the role of plant food in the site, but it is worth noting that only few, and doubtful, grindstones were found. No specialized implements are required for collecting the yugari which can be dug from the sand with foot or hand. This may in part be the reason for the paucity of artefacts at this site.

No positive evidence was forthcoming to indicate whether the Aboriginal occupation at the Cascade Gardens midden was of a seasonal or permanent nature. A seasonal factor may account for the large proportion of an open beach molluscan species favoured over its estuarine counterparts, the non-appearance of certain land and marine mammals and reptiles, and the low lithic content.

THE LITHIC CONTENT

The quantity of stone excavated, 26·8 kilograms, was rather small in comparison to that of shells, giving a ratio of about 1 kilogram of stone to 30 kilograms of shell. Only a small proportion of this stone showed any clear signs of knapping or use, 1·3 kilograms being waste flakes and chips, and 2·5 kilograms being implements, cores, and hammerstones with much pitting from use. The remaining 23 kilograms consisted of fragments of pebbles, apparently broken by weathering rather than by use. Undoubted implements were few (12) and the larger ones usually broken (6). This would give the very low ratio of about 1 implement per 66 kilograms of shell. Some surface material could have been removed by amateur collectors and one local collector claimed to have removed several boxes of artefacts from the fossicker's trench across the site. We are inclined to treat this as a statement for political purposes rather than exactitude, since the clearly undisturbed parts of the midden were no richer in artefacts than other parts, and since this poverty of implements appears characteristic of archaeologically recent middens in this district (Haglund-Calley, in press).

The raw materials used were pebbles of igneous rocks, quartzites, and a very little chalcedonic silica. No petrological study has yet been made in Queensland of material from archaeological sites, but a visual inspection indicated that the raw materials are those commonly found in surface sites in the area. The quartzites and the chalcedonic silica are frequently characteristically coloured or patterned and can sometimes be sorted into groups likely to have been derived from one nodule or outcrop. It is at times possible to join several flakes and fragments to reconstitute part of the original core which strengthens the case for such groupings. Intersite comparisons are, however still uncertain.

Few implements were found and the range of types was limited. The recognizable types, whole or in fragments, are tabulated in Table 1.

TABLE 1
RANGE OF IMPLEMENT TYPES

Type	Total*
Core, irregular, cf. fig. 1:4	3
Core tool with use-polished edge	1 + (10)
Core tool with use-polished and chipped and bruised working edges	1 + (9)
Core tool with chipped and bruised working edges	(12)
Core tool with short chipped working edges transverse to long axis, cf. 'picks' and fig. 1:7	1
Grind stone?	(9)
Core tool with grinding surface plus chipped working edge	(3)
Steep scraper, cf. fig. 1:6	2
Burin?, cf. fig. 1:5	1?
Micro scraper, cf. fig. 1:1-2	2
Serrated flake, cf. fig. 1:3	1
Ground edge axe, cf. fig. 1:8	1 + (5)

* Fragments constituting less than half the original artefact are quoted within brackets.

Unmodified waste flakes more than 10 millimetres long were measured in terms of greatest length in the direction of the detaching blow, greatest width at right angles to this, greatest thickness, and angle of striking platform. The results are shown as histograms in Fig. 3. The sample is very small, but since the histograms agree very closely with those resulting from the analysis of about 1300 waste flakes from a site nearby (Haglund-Calley, in press) it is likely that they do in fact reflect the technological tradition of the area during a certain period.

There was also a quantity of haematite in the site as well as some white devitrified chalcedonic silica which, being very powdery and soft, could also be interpreted as a pigment. The haematite occurred as soft crumbs, usually brick red, and as small lumps, harder and darker red, with one or more facets of polish suggesting that they had been rubbed against something hard and smooth, such as bone or wood. Since there was no evidence whatsoever that the site had been used as a burial ground the pigment must have been used on living bodies or artefacts as is still done in groups further north leading a traditional way of life (cf. Haglund-Calley, 1968).

DATING

The site contained a quantity of charcoal, but most, or possibly all, is likely to be contaminated. We found parts of the site still saturated with diesoline which had been used to start the fire clearing the area. Though we could locate the worst spots by smell there is no guarantee that other areas had not been affected to some extent. Some samples of charcoal taken from the lower horizon of shells (level 1B:2) on the eastern slope may be useful, having been covered with a considerably thicker layer of deposit and so being more protected, but it has not been considered worthwhile to test samples of such doubtful quality when other types of evidence indicate that the site is late in terms of Australian prehistory.

The geological formation underneath the site is not likely to date back more than 2–3000 years (Coaldrake, 1962; Gardner, 1955). The cultural deposit was thin and but thinly covered with sand and humus. The shells had not had time to weather badly even where the shell layer was thin and the action of rain water plus dissolved chemicals from the layer of humus would have had most effect. The meagre artefact content would not look out of place if added to that of the Broadbeach burial ground nearby which is securely dated to the last millenium before present. Bones of a turtle found near the surface but in undisturbed parts of the midden and clearly part of the cultural layer, had been cut with a thin metal saw of the type butchers still use, cf. Plate 27:d. A jaw fragment of the European hare was found in an undisturbed part of the midden which indicates that the camp site was in use well after 1870 (see Appendix I). This would be quite possible since, according to reliable sources (Lenz, undated), groups of natives were still wandering in the Nerang area as late as 1884.

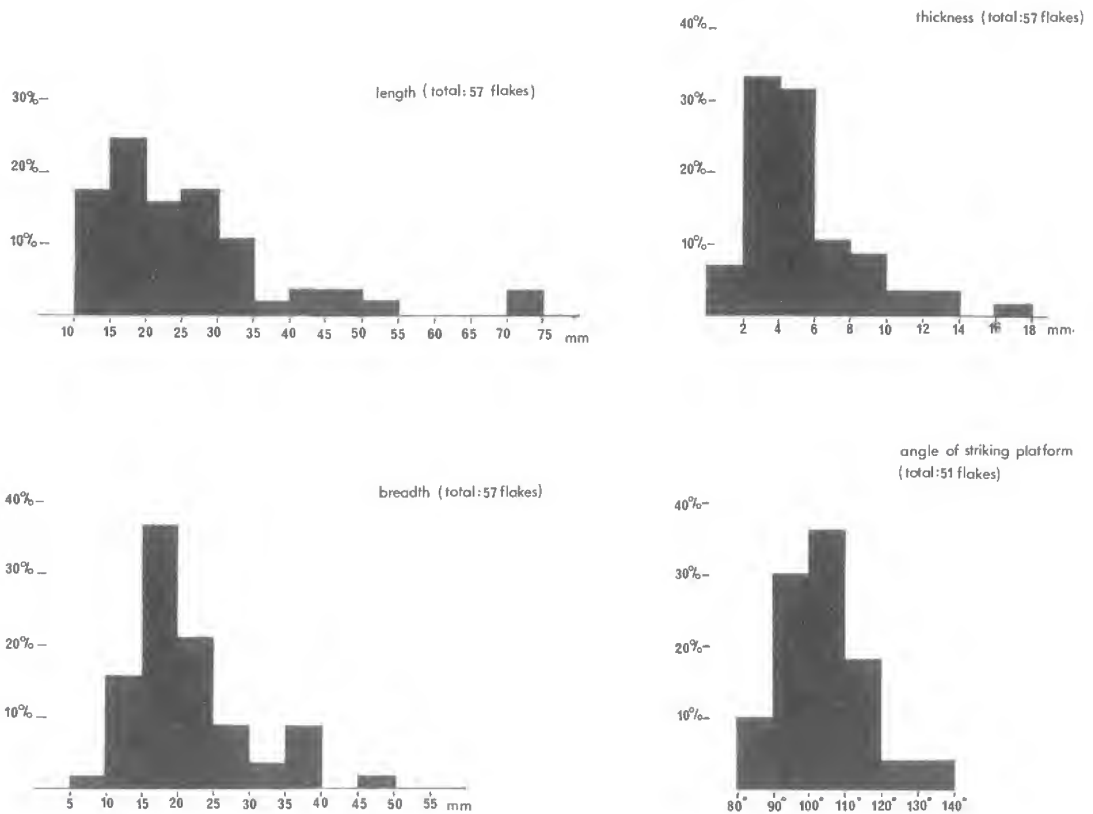


FIG. 3: Histograms showing the characteristics of waste flakes from the midden at Cascade Gardens.

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APPENDIX I

THE REPTILE AND MAMMAL REMAINS

Many of the remains are post-cranial fragments which cannot be identified positively but identifiable bones from the following species are present.

REPTILIA

- Chelydidae
Tortoise *Emydura* sp., possibly *Chelodina* sp.
- Cheloniidae
Turtle *Chelonia mydas* or *Caretta caretta*
- Agamidae
Bearded Dragon *Amphibolurus barbatus*
- Varanidae
Goanna *Varanus* sp. probably *V. varius*

MAMMALIA

- Peramelidae
Short-nosed Bandicoot *Isodon macrourus*
- Phalangeridae
Ring-tail Possum *Pseudocheirus peregrinus*
Brush-tail Possum *Trichosurus vulpecula*
- Macropodidae
Pademelon *Thylogale* sp.
Wallaby *Macropus* sp., probably *M. rufogrisae*
Swamp Wallaby *Wallabia bicolor*
- Muridae
Swamp Rat *Rattus lutreolus*
Rat *Rattus* sp., probably *fuscipes*
- Leporidae
European Hare *Lepus europaeus*

All are common in coastal southeastern Queensland today and most undoubtedly occurred at or very close to the camp site prior to and during early white settlement of the area. Several species are still found in the 'Cascade Gardens' Park which has been established on the site. Bearded Dragons, Lace Monitors, Bandicoots and Brush-tailed Possums have been observed there recently (March-May, 1969) and most of the others occur

within 8km of the site wherever suitable habitats have been preserved. Green and Loggerhead Turtles are common in Moreton Bay and are often seen in the Southport basin.

The remains of Pademelons, a Swamp Rat, and a European Hare are of special interest.

Pademelons, *Thylogale stigmatica* and *T. thetis* are usually confined to close and adjoining wet sclerophyll forests in southeastern Queensland. The camp site is in a sandy area which supported coastal wallum plant communities before 'civilization', so it seems reasonable to assume that the Pademelons had been hunted some distance from the camp. Closed and wet sclerophyll forest in which both species abound cover the Gold Coast hinterland except for cleared areas, and there is an isolated stand of closed forest in which a small population of *T. stigmatica* survives, in the Burleigh Heads National Park (B. Cook, pers. comm.) which is approximately 9.6 km from the site.

Rattus lutreolus is poorly represented in the Museum reference collection, probably because it is more difficult to trap than most other *Rattus* species, so its distribution in southeastern Queensland is uncertain. It is common on North Stradbroke Island and probably occurs on South Stradbroke Island although no survey work has been done on the latter. These Islands were a continuum until 1896 (Welsby, 1967, p. 331). *R. lutreolus* has been trapped in many other localities close to the camp site—Burleigh Heads, Lamington National Park, Mt Tamborine—so this species probably occurred throughout the coastal area in suitable habitats including the camp site.

The European Hare was brought into Australia (to Victoria) in 1870–71. (Troughton, 1941, p. 260). It is possible that the jaw bone found is more recent than the other skeletal material but, if not, its presence may be of use in dating the site.

Many reptiles and mammals which presumably would be suitable as a food source and are very common in the camp site area are not represented in the remains. It would not have been surprising to have found remains of the Blue-tongue Lizard (*Tiliqua scincoides*), Carpet Snake (*Morelia spilotes variegata*), Dugong (*Dugong dugon*), and the Common Dolphin (*Sotalia godami*) among others.

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APPENDIX II

THE MOLLUSCAN REMAINS

The midden was situated in close proximity to both estuarine and ocean beach environments, the former being more readily accessible. Molluscs represented in the midden sample included species characteristic of both habitat types.

Estuarine or tidal flat species:

Pyrazus ebeninus (Brugiere, 1792)

Crassostrea commercialis (Iredale and Roughley, 1953)

Regozara flava (Linne, 1758)

Anadara trapezia (Deshayes, 1840)

Ocean beach species:

Plebidonax deltoides (Lamarck, 1818)

Two species, *Polinices incei* (Philippi, 1851) and *Polinices conicus* (Lamarck, 1822), common to both environments, and a land pulmonate *Sphaerospira fraseri* (Griffith and Pidgeon, 1833) were also recorded.

Species composition of the sample was estimated in terms of relative proportions by weight.

Species	Weight in gms.
<i>Plebidonax deltoides</i>	185,594
<i>Pyrazus ebeninus</i>	1,698.2
<i>Polinices incei</i>	687.4
<i>Crassostrea commercialis</i>	61.75
* <i>Regozara flava</i>	16.1
<i>Anadara trapezia</i>	14.75
† <i>Polinices conicus</i>	4.8
† <i>Sphaerospira fraseri</i>	5.7

* represented by fragments.

† represented by a single specimen.

The shell midden could be considered as an artificial sample of the local mollusc fauna. Detailed ecological studies of both ocean beach and estuarine environments in southeast Queensland have yet to be conducted, however Dakin (1963) considered all marine species here represented to be 'common' in similar New South Wales intertidal areas. If food species selection was random, the midden sample would be expected to contain each species in a proportion relative to its local abundance. Results show, however, that the observed contribution of the Yugari, *Plebidonax deltoides* (in terms of shell weight) in the sample far exceeded its expected proportion indicating that this species was preferentially collected and was the dominant mollusc food species.

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